

Virginia Department of Health
Anthrax: Overview for Healthcare Providers

	Cutaneous	Inhalation	Gastrointestinal
Organism	<i>Bacillus anthracis</i> is a large, gram-positive, encapsulated, spore-forming, nonmotile rod.		
Reporting to Public Health	Suspected or confirmed cases require <u>immediate</u> notification to the local health department (LHD). See www.vdh.virginia.gov/LHD/index.htm .		
Infectious Dose	A few spores may cause infection.	As few as 1 to 3 spores may cause infection.	Unknown
Occurrence	Worldwide, especially in agricultural regions in Central and South America, sub-Saharan Africa, central and southwestern Asia, southern and eastern Europe and the Caribbean. ~95% of naturally-acquired infections in the world are cutaneous form. In US, 1–2 cases reported annually.		
Natural Reservoir	Primary reservoirs are herbivores (e.g., livestock and wildlife herbivores). Spores can remain dormant in contaminated soil for decades.		
Route of Infection	Contact via break in skin (especially, arms, hands, face, neck)	Inhalation of spores	Ingestion of contaminated meat from diseased animals
Communicability	Person-to-person transmission is very rare and has only rarely been reported for cutaneous anthrax via direct contact with lesions.		
Case-fatality Rate	<1% with treatment; 20 % without treatment	~ 75% with treatment; 97% without treatment	Unknown with treatment; 25%–60% without treatment
Risk Factors	Those at increased risk include persons who process animal products (e.g., hides, wool, hair, bone) from endemic areas, veterinarians, laboratorians, livestock producers, those who eat undercooked meat in endemic areas, heroin-injecting drug users; if bioterrorism, mail handlers, military personnel or other responders.		
Incubation period	1–7 days (1–12 days)	2–60 days or longer (2001 outbreak: 4–6 days)	2–5 days (range 1–7 days)
Clinical Manifestations	<ul style="list-style-type: none"> • Infection begins as a small papule or vesicle that ulcerates with central necrosis and drying. Painless, localized nonpitting edema surrounds the ulcerated area, which progresses to a dark, leathery eschar. Extensive nonpitting edema, regional lymphadenopathy, lymphangitis, fever, and malaise may be present. Lesions tend to occur on exposed areas of the body (e.g., face, hands, arms, neck). 	<ul style="list-style-type: none"> • Phase 1: Nonspecific, including fever, nonproductive cough, fatigue, myalgias, sweats, chest discomfort • Phase 2: Occurs after 1–3 days of improvement after Phase 1, with abrupt onset of high fever and severe respiratory distress (dyspnea, stridor, cyanosis); shock and death occurs within 24–36 hours at Phase 2. 	<ul style="list-style-type: none"> • Intestinal form is manifested with nausea, vomiting, anorexia and fever, followed by severe abdominal pain, bloody diarrhea, vomiting of blood, and signs of septicemia. • Oropharyngeal form is rare, manifested with dysphagia and posterior oropharyngeal necrotic ulcers, fever, sepsis, and bilateral neck swelling. • GI tract ulcers may cause hemorrhage, obstruction or perforation
Differential diagnosis	Brown recluse spider bite, staphylococcal or streptococcal cellulitis, vasculitides, bubonic plague, necrotizing soft tissue infections, orf, necrotic herpes simplex infection; ulceroglandular tularemia, scrub typhus, rickettsial spotted fevers, rat bite fever,	Mycoplasmal pneumonia, Legionnaires' disease, psittacosis, tularemia, viral pneumonia, Q fever, histoplasmosis, coccidioidomycosis, acute bacterial mediastinitis, tuberculosis	<ul style="list-style-type: none"> • Intestinal form: typhoid fever, intestinal tularemia, bacterial peritonitis • Oropharyngeal form: diphtheria, streptococcal pharyngitis, enteroviral vesicular pharyngitis, acute herpetic pharyngitis, <i>Yersinia enterocolitica</i>

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	ecthyma gangrenosum		
Radiography		Chest X-ray may show mediastinal widening, pleural effusion (often), or infiltrates (rare)	
Laboratory tests/Sample collection*	<ul style="list-style-type: none"> • If systemic symptoms present, blood cultures (before start antimicrobial therapy) • Swab vesicle/eschar/ulcer (2 dry cotton swabs per site: 1 for culture, 1 for PCR) • Full thickness punch biopsy of papule or vesicle including adjacent skin • If on antibiotics <24 hours, 2nd biopsy for culture and PCR • Acute serum for anthrax lethal toxin testing and acute and convalescent serum samples for serologic testing 	<ul style="list-style-type: none"> • Blood cultures (before antimicrobial therapy) • Blood (10mL in EDTA or sodium citrate tubes) for PCR • Pleural fluid, if present, for culture, PCR and anthrax lethal toxin testing • Plural and/or bronchial biopsies for immunohistochemistry (IHC) • CSF, if meningeal symptoms, for culture and PCR • Acute serum for anthrax lethal toxin testing and acute and convalescent serum samples for serologic testing • If fatal case, autopsy tissues for histopathology, special stains, and IHC 	<ul style="list-style-type: none"> • Blood cultures (before start antibiotics) • Blood (10mL in EDTA or sodium citrate tubes) for PCR • Ascites fluid for culture, PCR and anthrax lethal toxin testing • Oropharyngeal form: 2 sterile moist swabs (1 for culture and 1 for PCR) of suspected lesions in the oropharynx or buccal cavity, or on the tongue, tonsils or posterior pharyngeal wall • Intestinal form: rectal swab (using sterile dry swab) and/or an aseptically collected stool (collect 2 separate swabs per site: 1 for culture, 1 for PCR) • Acute and convalescent serum samples for serologic testing • If fatal case, autopsy tissues for histopathology, special stains, and IHC
	* If anthrax is suspected, notify LHD immediately to discuss the case and laboratory testing. Specimens should be sent to Division of Consolidated Laboratory Services (DCLS) <u>after</u> LHD has been consulted and testing has been approved by LHD/DCLS. The DCLS Emergency Duty Officer can be reached 24/7 at (804) 335-4617.		
Treatment	Drugs most often recommended for treatment are ciprofloxacin or doxycycline. Information on preferred drugs, dosing and duration of treatment can be found at: http://www.cdc.gov/anthrax/ . For additional information on dosing, please consult the package inserts.		
Postexposure Prophylaxis	Exposed individuals should receive a full 60-day prophylaxis treatment regardless of anthrax vaccination status. Information on preferred drugs, dosing and duration of prophylaxis can be found at: http://www.cdc.gov/anthrax/ . For additional information on dosing, please consult the package inserts.		
Infection Control	Use standard precautions; for patients with draining cutaneous wounds, add contact precautions.		
Vaccine	There is a vaccine licensed to prevent anthrax, but it is not typically available for the general public. Anthrax Vaccine Adsorbed (AVA) protects against cutaneous and inhalation anthrax and is approved by FDA for at-risk adults before exposure to anthrax. At-risk individuals include people who work with imported animal hides or furs, handle animal products in high-risk areas, work with anthrax in a lab, have repeated exposures to anthrax spores, or are military personnel who work in areas where anthrax could be used as a bioterrorism weapon. Currently, FDA has not approved the vaccine for use after exposure for anyone. If there was an emergency, people who were exposed might be given vaccine to help prevent disease under a special protocol for use of the vaccine during emergencies.		